

A8. Water Quality and Other Expected Benefits

Attachment 8 identifies the costs and water quality and other benefits attributed to the seven projects proposed for implementation in the Santa Barbara County Region Proposition 84 (Prop 84) IRWM Implementation Grant Application – Round 1 (Proposal). The monetized Proposal water quality and other benefits total \$7.4 million.

This suite of projects can best be framed by the mutual challenges faced by both the state and the region. This Proposal aggressively meets these challenges that include persistent drought, a collapsing Bay-Delta ecosystem, need for equitable distribution of benefits among communities, aging infrastructure, poor water quality, and climate change.

The region takes aim at the challenge of drought and the need to reduce dependence on the Bay-Delta with a suite of water use efficiency and water recycling projects. Water use efficiency is a long-term supply option that not only reduces water use and stretches existing supplies but saves considerable capital and reduces operating costs. Furthermore, the region answers the challenge of improving water quality with advanced technology to treat water to a higher level that will improve ocean water quality and result in higher-quality recycled water. It answers the challenge of climate change with projects that reuse, conserve, and match water use to water quality. It answers the challenge of outdated infrastructure with projects that update water distribution systems, water treatment facilities, and flood control facilities – all with the additional benefit of enhancing ecosystems.

Each of the seven Projects included in this Proposal achieves significant benefits. However, because Project 7 is a feasibility study with no quantifiable benefits until implementation of potential distribution systems and tertiary treatment facilities following the feasibility study, Project 7 is not included in the economic analysis per Department of Water Resources (DWR) instructions.

Several projects included in this Proposal target water quality and other benefits by:

- Improving quality of groundwater, stormwater runoff, agricultural water runoff, and treated water discharges to regional water bodies
- Improving drinking water quality through management of local supply resources and complying with water quality standards
- Improving wastewater quality by utilizing advanced treatment of wastewater
- Protecting and improving groundwater quality
- Improving air quality and reducing carbon footprint
- Other benefits specific to each Project

PROJECT 1:

City of Lompoc, Lompoc Valley Leak Detection and Repair Project

Project 1: City of Lompoc, Lompoc Valley Leak Detection and Repair Project

The Lompoc Valley Leak Detection Project (Project 1 or Project) is a multiagency project involving the City of Lompoc (Lompoc [DAC]), Mission Hills Community Services District (MHCS D), and Vandenberg Village Community Services District (VVCSD). These agencies are cooperating to complete a leak detection audit and repair program of their respective water distribution systems, which will also benefit the health of the overall basin and conserve shared water resources.

Lompoc estimates an overall 6 percent water loss within its water distribution system, while MHCS D and VVCSD estimate up to 15 percent water loss. These estimates are based on system assessments by the three Project proponents. In the past, the Project proponents have responded to water distribution losses as they are found, which is an inefficient and less effective way of addressing the problem of water loss. An overall water distribution system leak detection audit has never been completed and is needed in order to best manage and conserve water resources. The Project proponents anticipate that the leak detection survey will help reduce water loss to at least 1 percent, avoiding unnecessary groundwater pumping and water treatment costs.

The benefits of a leak detection and repair program could be extensive. These may not only include water savings but reduced production costs (for example, energy and operations and maintenance), emergency repairs, administration costs, property damage, risk for lawsuits, insurance and legal fees, and improved public relations (Appendix 7-1, Leak Detection Benefits). The physical non-water supply benefits associated with Project 1 are summarized in Exhibit 8-1.1 and 8-1-2.

EXHIBIT 8-1.1

Project 1 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits		
Avoided Water Supply Costs		
Avoided groundwater pumping	Monetized	Local
Avoided water treatment costs	Monetized	Local
Avoided power costs	Monetized	Local
Increased groundwater supply	Qualitative	Local
Water Quality and Other Expected Benefits (Attachment 8)		
Improved air quality	Qualitative	Local/State

EXHIBIT 8-1.2

Project 1 Benefit and Cost Summary

Type of Benefits/Costs	Present Value
Capital and O&M Costs	\$660,970
Quantitative Benefits	
Avoided Water Supply Costs	\$1,142,380
Avoided groundwater pumping	Component of avoided water supply costs
Avoided water treatment costs	Component of avoided water supply costs
Avoided power costs	Component of avoided water supply costs
Improved air quality	Reduction of 2.9 million pounds of carbon dioxide emissions
Qualitative Benefits	Qualitative Indicator
Increased groundwater supply	+
Notes:	
+ indicates net benefits are likely to increase	
++ indicates net benefits are likely to increase significantly	
O&M = operations and maintenance	

Water Quality and Other Benefits

Improved Air Quality and Reduced Carbon Footprint

With the Project, Lompoc will avoid pumping 43 AFY; MHCSO will avoid pumping 57 AFY; and VVCSD will avoid pumping 113 AFY. The reduced pumping will save power required for pumping and treatment. This in turn will reduce emissions generated to produce power, including a reduction in carbon dioxide. The average electricity requirement per AF for treatment and distribution is 489 kilowatt hours (kWh) (Appendix 8-1, Water Treatment and Distribution Energy Requirements). This is a conservative estimate, assuming that little is involved in the conveyance of water from source to treatment plant. Considering that in California 0.61 pounds of carbon emissions results from each kWh of electricity produced, the Project will reduce carbon dioxide emissions by 63,000 pounds per year (Appendix 8-1, Energy and Greenhouse Gas Emissions). In total, approximately 2.9 million pounds of carbon dioxide emissions will be avoided with the Project (Table 16-1), hence the carbon footprint will be reduced and negative climate change impacts will also be reduced.

Other Benefits

Several other benefits can be attributed to leak detection and repair programs. In addition to the benefits in Attachment 7, the conservation benefits and the improved air quality, reducing leaks in a water distribution system can help avoid property damage, risk for lawsuits, and insurance and legal fees. Although these benefits are only discussed qualitatively, analysis indicates that the monetized benefits claimed for this Project are likely on the low end.

Distribution of Benefits and Identification of Beneficiaries

The improved air quality will benefit the residents within the service areas of the City of Lompoc and those served by MHCSD and VVCSD. The reduction in carbon dioxide emissions will also benefit the residents of California. Reduced carbon emissions is a goal of the State of California as reflected in *Assembly Bill 32, Global Warming Solutions Act of 2006* (Appendix 8-1).

Benefits Timeline

The estimated life of the Project is over the entire period of analysis, which is 48 years beginning in 2009. The Project will begin in 2011, and benefits will begin in full in year 2013, after initial Project implementation. Leak repair activities will occur throughout the Project life, maintaining the anticipated system loss total at less than 1 percent..

Potential Adverse Effects

Project 1 will cause minor disturbances that will be mitigated, and there are no long-term impacts expected as a result of the Project. Any unforeseen temporary impacts will be mitigated. Portions of the City of Lompoc, which are subject to the Cultural Resources Overlay (CRO), will be excluded from repair or replacement of water mains or service lines, as part of this Project. Leaks found in the CRO areas will be repaired at a later date, because ground disturbance within these areas requires the presence of a National Register Qualified Archaeologist and would significantly increase the costs of implementation. The only exception will be major leaks that are determined to be a high priority for repair by staff. These repairs will require the presence of a National Register Qualified Archaeologist. Based upon historical leak patterns and infrastructure at risk for leaks, however, there is lower potential for leakages to occur in CRO areas.

Summary of Findings

Project benefits will occur from the reduced emissions resulting from the reduction in energy requirements. Several other benefits can be attributed to leak detection, as mentioned above. Because improved air quality and other benefits are only discussed qualitatively, monetized benefits claimed for this Project are likely on the low end.

Uncertainties

There is uncertainty regarding the benefits of improved air quality. Current benefit descriptions are based on existing population. Unforeseen regulation and changes in population are factors that may significantly increase benefits. If multiple significant leaks are found in areas subject to a CRO and require the presence of a National Register Qualified Archaeologist, the cost of implementation may increase from the original estimate; however, as indicated above, based on historical leak patterns and infrastructure at risk for leaks, there is lower potential for leakages to occur in CRO areas.

Table 16-1, Water Quality and Other Expected Benefits (Benefits in 2009 dollars) Project 1: Lompoc Valley Leak Detection and Repair Project									
(a) Year	(b) Type of Benefit a) avoided carbon dioxide emissions	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit \$ Value (1)	(h) Annual \$ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	CO ₂	Pounds	0	0	0	N/A	N/A	N/A	N/A
2010	CO ₂	Pounds	0	0	0	N/A	N/A	N/A	N/A
2011	CO ₂	Pounds	0	0	0	N/A	N/A	N/A	N/A
2012	CO ₂	Pounds	0	0	0	N/A	N/A	N/A	N/A
2013	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2014	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2015	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2016	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2017	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2018	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2019	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2020	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2021	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2022	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2023	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2024	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2025	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2026	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2027	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2028	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2029	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2030	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2031	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2032	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2033	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2034	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2035	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2036	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2037	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2038	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2039	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2040	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2041	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2042	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2043	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2044	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2045	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2046	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2047	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2048	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2049	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2050	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2051	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2052	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2053	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2054	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2055	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2056	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2057	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
2058	CO ₂	Pounds	0	63,000	-63,000	N/A	N/A	N/A	N/A
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									N/A
Comments: The expected useful life of the project is 48 years.									

(1) Complete these columns if dollar value is being claimed for the benefit.

PROJECT 2:

City of Santa Maria, Untreated Water Landscape Irrigation Project

Project 2: City of Santa Maria, Untreated Water Landscape Irrigation Project

The City of Santa Maria (City) Untreated Water Landscape Irrigation Project (Project 2 or Project) will extend an existing groundwater-based landscape irrigation system from the City’s Civic Center area to serve a state and local public facility with large landscaped areas. The proposed irrigation system will consist of several old production water wells that were removed from the domestic supply because of high nitrate concentrations. These wells will be rehabilitated and put into service to irrigate turf and other landscapes through a piping system that will be isolated from the domestic supply piping.

The Project will enable the City to improve water quality standards without additional SWP supplies. This will result in avoided water supply purchases, improved water quality for the City’s service area, avoided landscape fertilization costs, and higher quality wastewater treatment plant outflow, which will further improve the health of the groundwater basin in terms of water quality. This will not only benefit the City of Santa Maria, but other users including the City of Guadalupe (DAC) as well as agricultural growers. In addition, this Project will ensure high-quality water supply for the neighboring region of Nipomo, as mandated in the Santa Maria Groundwater Litigation Lead Case No. CV 770214. The region of Nipomo is mandated to purchase a minimum of 2,500 acre-feet (AF) of supplemental water annually from the City of Santa Maria to protect and sustain regional water supplies within the San Luis Obispo County Nipomo Mesa Management Area. Meeting water supply efficiency and reliability in the southern part of the county is a priority identified in the IRWM Plan.

The benefits associated with the Project are summarized in Exhibit 8.2-1. A comparison of the costs and benefits is provided in Exhibit 8.2-2.

EXHIBIT 8.2-1
Project 2 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits (Attachment 7)		
Avoided water supply costs	Monetized	Local
Avoided water treatment costs	Monetized	Local
Avoided groundwater pumping	Monetized	Local
Water Quality and Other Expected Benefits		
M&I water quality benefits	Monetized	Local
Improved groundwater quality	Qualitative	Local
Avoided landscaping costs	Monetized	Local
Notes:		
M&I = Municipal and Industrial		

EXHIBIT 8.2-2

Project 2 Benefit and Cost Summary

Type of Benefit/Costs	Present Value
Capital and O&M Costs	\$1,042,416
Quantitative Benefits	
Avoided water supply costs	\$269,509
Avoided water treatment costs	\$46,228
Avoided groundwater pumping	\$138,684
M&I water quality benefits	\$979,061
Avoided landscaping costs	\$965
Qualitative Benefits	Qualitative Indicator
Improved groundwater quality	+
+ indicates net benefits are likely to increase	
++ indicates net benefits are likely to increase significantly	

Water Quality Benefits

M&I Water Quality Benefits

Without the Project, the City of Santa Maria would continue to rely on a combination of SWP water from the Central Coast Water Authority (CCWA) via the Coastal Aqueduct, and groundwater supply from the Santa Maria Valley Groundwater Basin. The total average available supply is 49,710 acre-feet per year (AFY) through 2030 with service area demand increasing from 19,129 AF in 2010 to 24,780 AF in 2030 (Appendix 8-2, City of Santa Maria Urban Water Management Plan).

With the Project, the City of Santa Maria's secondary water efficiency system will produce 160 AFY for landscape irrigation. Relying on 160 AF of groundwater for landscape irrigation will improve the domestic water quality provided by the City, because a higher ratio of SWP supplies will be used. With the higher SWP ratio resulting from the Project, the City anticipates water quality in the system to be lower in hardness and total dissolved solids (TDS). Based on the City's assessment of average use of SWP and groundwater supplies, hardness is anticipated to be approximately 2 milligrams per liter (mg/L) lower, and equivalent reductions are expected for TDS.

As water quality decreases, residential households sustain damage in terms of a reduction in life of appliances (for example, dishwasher) or the additional costs of bottled water. Essentially, burdensome cost incurred by a household due to a change in water quality can be considered damage. Based on a simple spreadsheet model that estimates the avoided damages for residential customers from improved water quality, the annual average avoided damages with the Project total \$70,225 in 2010 (Appendix 8-2, M&I Water Quality). The spreadsheet model estimates damages based on the number of households, average water quality in the City of Santa Maria service area, and damage functions for household fixtures (for example, dishwashers and

faucets). Damage estimates for the City are consistent with estimates from similar models when evaluating damage estimates and household population, \$0.10 to \$0.70 annual avoided cost per household, per unit change in TDS (mg/L) (Appendix 8-2, Metropolitan Water Quality Report). However, because the City relies on groundwater, the City has relatively high levels of TDS and hardness (859.0 and 547.5 mg/L, respectively), elevating the annual avoided damages to \$1.23 per household per unit change in TDS (mg/L). The present value of the avoided damages from improved water quality over the life of the Project, accounting for population growth trends, is \$979,061 (Table 16A-2) (Appendix 8-2, City of Santa Maria Urban Water Management Plan).

Although benefits from improved hardness and TDS are monetized, there are other potential water quality benefits that are not. By reducing the overall ratio of groundwater used in the domestic water supply, there is a potential reduction in nitrates and other contaminants. These other changes in water quality are not quantified; therefore, this benefit is discussed qualitatively.

Improved Groundwater Quality

Without the Project, the City of Santa Maria would continue to rely on a combination of SWP and groundwater supplies. With the Project, the City of Santa Maria will utilize 160 AF of groundwater for landscape irrigation. This process, while improving domestic water supply, also will improve the wastewater outflow quality. Higher quality wastewater outflow, through percolation, will improve groundwater quality.

Groundwater quality at the site of the rehabilitated wells will also improve. By pumping groundwater high in nitrates and using the groundwater supply for landscape irrigation, the irrigated area will use the nitrogen, removing it from the water supply, improving overall groundwater quality. Specific changes in groundwater quality in these areas have not been quantified; therefore, this benefit is discussed qualitatively.

Other Benefits

Avoided Landscaping Costs

Using the 160 AF of groundwater to irrigate landscape will also result in the benefit of avoided maintenance. When the high nitrate water is applied to landscaping, the plants will use the nitrate as a nutrient. This process will reduce the need for chemical fertilizers. It is estimated that using the rehabilitated groundwater for landscape irrigation will result in the application of 174 pounds of nitrogen per acre per year (Appendix 8-2, Nitrogen Landscape Use). Therefore, irrigating 24 acres of landscape with the well water will result in a savings of \$835 per year (174 pounds * 24 acres * \$0.20 per pound). The present value of the avoided damages from avoided landscaping costs over the life of the Project is \$965 (Table 16B-2).

Distribution of Benefits and Identification of Beneficiaries

The City provides water supply and wastewater treatment services to the City of Santa Maria and neighboring areas. The avoided water quality damages and landscape maintenance costs will benefit the City service area. The long-term reduction in groundwater nitrates may also benefit other urban groundwater users such as the City of Guadalupe (which supplies water to the unincorporated community of Orcutt in northern Santa Barbara County).

Benefits Timeline

The estimated life of the Project is 32 years. Annual operation, maintenance, and repair costs along with the benefits from the Project will begin in full in year 2013, after 2 years of Project construction beginning in 2011.

Potential Adverse Effects

Temporary impacts as a result of construction of the Project will be mitigated. However, with most pipeline and wellhead Projects, no significant impacts are expected. The new water efficiency system will use existing wells, and the distribution system will run adjacent to existing conveyance facilities. No long-term adverse impacts are expected as a result of the Project.

Summary of Findings

The majority of other benefits as a result of Project 2 will be water quality benefits, which total \$979,061 over the life of the Project. Avoided landscaping costs contribute slightly to the Project benefits, while improved groundwater quality is only discussed qualitatively.

Uncertainties

There is uncertainty regarding the level of benefits from improved domestic water quality. Current estimates are based on the expected blending ratio of SWP and groundwater and current population and historic hydrology. Unforeseen regulation and changes in historical hydrology due to global climate change are factors that may significantly increase the benefits of an incremental reduction in the groundwater used in the domestic water supply. For example, additional SWP pumping restrictions at the Delta or reoperation of the SWP system due to regulatory or infrastructure changes would affect future SWP deliveries, as well as the significance of removing an AF of groundwater from the existing blended domestic water supply.

Table 16A-2, Water Quality and Other Expected Benefits									
(Benefits in 2009 dollars)									
Project 2: City of Santa Maria, Untreated Water Landscape Irrigation Project									
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit a) avoided water quality damages	Measure of Benefit (Units)	Without Project	With Project	Change Resulting from Project (e) – (d)	Unit \$ Value (1)	Annual \$ Value (f) x (g) (1)	Discount Factor (1)	Discounted Benefits (h) x (i) (1)
2009	a	TDS	859	859	0	\$35,113	\$0	1.000	\$0
2010	a	TDS	859	859	0	\$35,113	\$0	0.943	\$0
2011	a	TDS	859	859	0	\$35,656	\$0	0.890	\$0
2012	a	TDS	859	859	0	\$36,199	\$0	0.840	\$0
2013	a	TDS	859	857	2	\$36,742	\$73,483	0.792	\$58,199
2014	a	TDS	859	857	2	\$37,285	\$74,569	0.747	\$55,703
2015	a	TDS	859	857	2	\$37,828	\$75,655	0.705	\$53,337
2016	a	TDS	859	857	2	\$38,371	\$76,741	0.665	\$51,033
2017	a	TDS	859	857	2	\$38,914	\$77,827	0.627	\$48,798
2018	a	TDS	859	857	2	\$39,457	\$78,913	0.592	\$46,716
2019	a	TDS	859	857	2	\$40,000	\$79,999	0.558	\$44,639
2020	a	TDS	859	857	2	\$40,543	\$81,085	0.527	\$42,732
2021	a	TDS	859	857	2	\$41,086	\$82,171	0.497	\$40,839
2022	a	TDS	859	857	2	\$41,629	\$83,257	0.469	\$39,048
2023	a	TDS	859	857	2	\$42,172	\$84,343	0.442	\$37,280
2024	a	TDS	859	857	2	\$42,715	\$85,429	0.417	\$35,624
2025	a	TDS	859	857	2	\$43,258	\$86,515	0.394	\$34,087
2026	a	TDS	859	857	2	\$43,801	\$87,601	0.371	\$32,500
2027	a	TDS	859	857	2	\$44,344	\$88,687	0.350	\$31,040
2028	a	TDS	859	857	2	\$44,887	\$89,773	0.331	\$29,715
2029	a	TDS	859	857	2	\$45,430	\$90,859	0.312	\$28,348
2030	a	TDS	859	857	2	\$45,973	\$91,945	0.294	\$27,032
2031	a	TDS	859	857	2	\$46,516	\$93,031	0.278	\$25,863
2032	a	TDS	859	857	2	\$47,059	\$94,117	0.262	\$24,659
2033	a	TDS	859	857	2	\$47,602	\$95,203	0.247	\$23,515
2034	a	TDS	859	857	2	\$48,145	\$96,289	0.233	\$22,435
2035	a	TDS	859	857	2	\$48,688	\$97,375	0.220	\$21,423
2036	a	TDS	859	857	2	\$49,231	\$98,461	0.207	\$20,381
2037	a	TDS	859	857	2	\$49,774	\$99,547	0.196	\$19,511
2038	a	TDS	859	857	2	\$50,317	\$100,633	0.185	\$18,617
2039	a	TDS	859	857	2	\$50,860	\$101,719	0.174	\$17,699
2040	a	TDS	859	857	2	\$51,403	\$102,805	0.164	\$16,860
2041	a	TDS	859	857	2	\$51,946	\$103,891	0.155	\$16,103
2042	a	TDS	859	857	2	\$52,489	\$104,977	0.146	\$15,327
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table)									\$979,061
Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									
Comments: The expected useful life of the project is 32 years. TDS: total dissolved solids									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16B-2, Water Quality and Other Expected Benefits									
(Benefits in 2009 dollars)									
Project 2: City of Santa Maria, Untreated Water Landscape Irrigation Project									
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit b) avoided fertilizer costs	Measure of Benefit (Units)	Without Project	With Project	Change Resulting from Project (e) – (d)	Unit \$ Value (1)	Annual \$ Value (f) x (g) (1)	Discount Factor (1)	Discounted Benefits (h) x (i) (1)
2009	b	Pounds	4,176	4,176	0	\$0.02	\$0	1.000	\$0
2010	b	Pounds	4,176	4,176	0	\$0.02	\$0	0.943	\$0
2011	b	Pounds	4,176	4,176	0	\$0.02	\$0	0.890	\$0
2012	b	Pounds	4,176	4,176	0	\$0.02	\$0	0.840	\$0
2013	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.792	\$66
2014	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.747	\$62
2015	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.705	\$59
2016	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.665	\$56
2017	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.627	\$52
2018	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.592	\$49
2019	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.558	\$47
2020	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.527	\$44
2021	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.497	\$42
2022	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.469	\$39
2023	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.442	\$37
2024	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.417	\$35
2025	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.394	\$33
2026	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.371	\$31
2027	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.350	\$29
2028	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.331	\$28
2029	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.312	\$26
2030	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.294	\$25
2031	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.278	\$23
2032	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.262	\$22
2033	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.247	\$21
2034	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.233	\$19
2035	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.220	\$18
2036	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.207	\$17
2037	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.196	\$16
2038	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.185	\$15
2039	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.174	\$15
2040	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.164	\$14
2041	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.155	\$13
2042	b	Pounds	4,176	0	4,176	\$0.02	\$84	0.146	\$12
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table)									\$965
Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									
Comments: The expected useful life of the project is 32 years.									
TDS: total dissolved solids									

(1) Complete these columns if dollar value is being claimed for the benefit.

PROJECT 3:

City of Santa Maria, LeakWatch Project

Project 3: City of Santa Maria, LeakWatch Project

The City of Santa Maria is implementing the LeakWatch Project (Project 3 or Project), a water metering Project to collect and evaluate water use data on a near-real-time basis. Without the Project, existing meters are only read on a monthly basis; problems such as water loss due to leaks are difficult to detect; and customers are unable to respond and conserve water without timely information. With the Project, real-time data will be broken down to show usage by hour; this data may indicate significant use or a water leak if there is water use at all hours of the day.

The system includes base stations; converted water meter registers, transmitters, and associated software. The data provided by the fixed-base system is used to detect leaks and assist customers to make expeditious and judicious decisions regarding water usage, especially regarding landscape irrigation. Approximately 4,720 meters will be converted through in-place modification to enable the meters to send data to the base stations. It is estimated that this phase of installation will conserve up to 210 AFY of the domestic water supply. The program will also assist with water shortage contingency planning, allowing the City of Santa Maria to track hourly water usage to assure that customers are abiding by restrictions on water use or schedules. Through reduced water use, the Project will allow the City to reduce purchases of SWP water to meet wastewater plant effluent water quality requirements, as required in the City's Long-Term Water Management Plan. This will reduce pressure on the Delta and its ecosystems in addition to saving the City and its customers' financial resources. It also will act as a form of community education by raising awareness of water use and the amounts households use. The benefits associated with the Project are summarized in Exhibit 8-3.1. A comparison of the costs and benefits is provided in Exhibit 8-3.2.

EXHIBIT 8-3.1

Project 3 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits (Attachment 7)		
Avoided Water Supply Costs		
Avoided water supply purchases	Monetized	Local
Avoided groundwater pumping	Monetized	Local
Avoided water treatment costs	Monetized	Local
Increased groundwater supply	Quantitative	Local
Water Quality and Other Expected Benefits		
M&I water quality benefits	Monetized	Local
Improved groundwater quality	Qualitative	Local
Avoided staffing costs	Monetized	Local
Improved air quality	Qualitative	Local/State

EXHIBIT 8-3.2

Project 3 Benefit and Cost Summary

Type of Benefits/Costs	Present Value
Capital and O&M Costs	\$1,993,716
Quantitative Benefits	
Avoided Water Supply Costs	\$405,549
Avoided water treatment costs	\$42,758
M&I water quality benefits	\$354,818
Avoided staffing costs	\$930,089
Qualitative Benefits	Qualitative Indicator
Increased groundwater supply	+
Improved groundwater quality	+
Improved air quality	+
+ indicates net benefits are likely to increase with Project	
++ indicates net benefits are likely to increase significantly with Project	

Water Quality Benefits

M&I Water Quality Benefits

Without the Project, the City of Santa Maria would continue to rely on a combination of SWP water from the CCWA via the Coastal Aqueduct and groundwater supply from the Santa Maria Valley Groundwater Basin. The total average available supply is 49,710 AFY through 2030 with service area demand increasing from 19,129 AF in 2010 to 24,780 AF in 2030 (Appendix 8-3, City of Santa Maria Urban Water Quality Management Plan).

With the Project, LeakWatch will prevent 210 AFY of conservation and system loss. The reduction in overall water use will improve the domestic water quality provided by the City, because the City would use all of its SWP allocation even if total water use decreased through leak reduction. With the Project, the City anticipates water quality in the system to be lower in hardness and TDS. Reductions are expected to be approximately 1 mg/L.

As water quality decreases, damages occur to residential households. This damage may include the reduced life of appliances, (for example, dishwasher) or the additional purchase of bottled water. Essentially, additional cost incurred by a household due to a change in water quality can be considered damage. Based on a simple spreadsheet model that estimates the avoided damages for residential customers from improved water quality, the annual average avoided damages with the Project total \$35,130 in 2010 (Appendix 8-3, M&I Water Quality). The spreadsheet model estimates damages based on the number of households, average water quality in the City of Santa Maria service area, and damage functions for household fixtures (for example, dishwashers and faucets). Damage estimates for the City are consistent with estimates from similar

models when evaluating damage estimates and household population (\$0.10 to \$0.70 annual avoided cost per household, per unit change in TDS [mg/L] [Appendix 8-3, Metropolitan Water Quality Report]). However, because the City relies on groundwater, the City has relatively high levels of TDS and hardness (859.0 and 547.5 mg/L, respectively), elevating the annual avoided damages to \$1.23 per household per unit change in TDS (mg/L). The present value of the avoided damages from improved water quality over the life of the Project, accounting for projected population growth, is \$354,818 (Table 16A-3) (Appendix 8-3, City of Santa Maria Urban Water Quality Management Plan).

Although benefits from improved hardness and TDS are monetized, other potential water quality benefits are not. By reducing the overall ratio of groundwater used in the domestic water supply, there is a potential reduction of nitrates and other contaminants in M&I supplies. These other changes in water quality are not quantified; therefore, this benefit is discussed qualitatively.

Improved Groundwater Quality

Without the Project, the City of Santa Maria would continue to rely on a combination of SWP and groundwater supplies. With the Project, the City will save 210 AFY and reduce the overall groundwater used in its domestic water supply. This process, while improving domestic water supply, also will improve the wastewater outflow quality. Higher quality wastewater outflow will improve groundwater quality because the City uses treated effluent for groundwater recharge.

Other Benefits

Avoided Staffing Costs

By automating the water meter system, the City will save a total of \$105,740 per year. The City estimates that the savings will come from a reduction in the number of hours of staff in the field, fuel savings and other vehicle costs, and the ability to perform rereads, transfers, and water audits more efficiently. The present value of the avoided staffing costs over the life of the Project is \$930,089 (Table 16B-3).

Improved Air Quality

With the Project, the fuel savings from reduced vehicle use will improve local air quality and reduce greenhouse gas emissions. Reduced emissions have not been quantified; therefore, this benefit is discussed qualitatively.

Other Benefits

Several other benefits can be attributed to leak detection and repair programs. In addition to the benefits in Attachment 7 and above, reducing leaks in an agency's water distribution system can help avoid property damage, risk for lawsuits, insurance and legal fees, and may also improve public relations. Although these benefits are only

discussed qualitatively, analysis indicates that the monetized benefits claimed for this Project are likely on the low end.

Distribution of Benefits and Identification of Beneficiaries

The City provides water supply and wastewater treatment services to the City of Santa Maria and neighboring areas. The avoided water quality damages would be a benefit to the City service area. The improved air quality will benefit the residents within the service areas of the City of Santa Maria. The reduction in carbon dioxide emissions will benefit the residents of California. Reduced carbon emissions is a goal of the State of California as reflected in *Assembly Bill 32, Global Warming Solutions Act of 2006*.

Benefits Timeline

The estimated life of the Project is 19 years. Benefits will begin in 2012, after 1 year of Project implementation beginning in 2012. With initial water savings of 178 AFY, water quality benefits and avoided staffing costs are expected to begin in 2012.

Potential Adverse Effects

Temporary impacts from Project implementation will be minimal. The new metering system will be integrated into the existing metering system. No long-term impacts are expected from leak detection and repair, and no adverse impacts are expected after construction/installation.

Summary of Findings

The monetized water quality and other benefits of Project 3 will be from the improved water quality and avoided staffing costs. The monetized benefits for the City of Santa Maria total \$1,239,093 over the life of the Project. Improved groundwater quality, air quality, and other benefits from leak repair are discussed qualitatively; therefore, the total monetized benefits likely represent a low-end estimate.

Uncertainties

There is uncertainty regarding the level of benefits from improved domestic water quality. Current estimates are based on the expected blending ratio of SWP and groundwater and current population and historic hydrology. Unforeseen regulation and changes in historical hydrology due to global climate change are factors that may significantly increase the benefits of an incremental reduction in the groundwater used in the domestic water supply. For example, additional SWP pumping restrictions at the Delta or reoperation of the SWP system due to regulatory or infrastructure changes would affect future SWP deliveries, as well as the significance of removing an AF of groundwater from the existing blended domestic water supply.

Table 16A-3, Water Quality and Other Expected Benefits (Benefits in 2009 dollars) Project 3: City of Santa Maria, LeakWatch Project									
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit a) avoided water quality damages	Measure of Benefit (Units)	Without Project	With Project	Change Resulting from Project (e) – (d)	Unit \$ Value (1)	Annual \$ Value (f) x (g) (1)	Discount Factor (1)	Discounted Benefits (h) x (i) (1)
2009	a	TDS	859	859	0	\$35,113	\$0	1.000	\$0
2010	a	TDS	859	859	0	\$35,113	\$0	0.943	\$0
2011	a	TDS	859	859	0	\$35,656	\$0	0.890	\$0
2012	a	TDS	859	859	0	\$36,199	\$0	0.840	\$0
2013	a	TDS	859	858	1	\$36,742	\$36,742	0.792	\$29,099
2014	a	TDS	859	858	1	\$37,285	\$37,285	0.747	\$27,852
2015	a	TDS	859	858	1	\$37,828	\$37,828	0.705	\$26,668
2016	a	TDS	859	858	1	\$38,371	\$38,371	0.665	\$25,516
2017	a	TDS	859	858	1	\$38,914	\$38,914	0.627	\$24,399
2018	a	TDS	859	858	1	\$39,457	\$39,457	0.592	\$23,358
2019	a	TDS	859	858	1	\$40,000	\$40,000	0.558	\$22,320
2020	a	TDS	859	858	1	\$40,543	\$40,543	0.527	\$21,366
2021	a	TDS	859	858	1	\$41,086	\$41,086	0.497	\$20,419
2022	a	TDS	859	858	1	\$41,629	\$41,629	0.469	\$19,524
2023	a	TDS	859	858	1	\$42,172	\$42,172	0.442	\$18,640
2024	a	TDS	859	858	1	\$42,715	\$42,715	0.417	\$17,812
2025	a	TDS	859	858	1	\$43,258	\$43,258	0.394	\$17,043
2026	a	TDS	859	858	1	\$43,801	\$43,801	0.371	\$16,250
2027	a	TDS	859	858	1	\$44,344	\$44,344	0.350	\$15,520
2028	a	TDS	859	858	1	\$44,887	\$44,887	0.331	\$14,857
2029	a	TDS	859	858	1	\$45,430	\$45,430	0.312	\$14,174
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									\$354,818
Comments: The expected useful life of the project is 19 years. TDS: total dissolved solids									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16B-3, Water Quality and Other Expected Benefits (Benefits in 2009 dollars) Project 3: City of Santa Maria, LeakWatch Project									
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit b) avoided staffing costs	Measure of Benefit (Units)	Without Project	With Project	Change Resulting from Project (e) – (d)	Unit \$ Value (1)	Annual \$ Value (f) x (g) (1)	Discount Factor (1)	Discounted Benefits (h) x (i) (1)
2009	b	N/A	N/A	N/A	N/A	\$0	\$0	1.000	\$0
2010	b	N/A	N/A	N/A	N/A	\$0	\$0	0.943	\$0
2011	b	N/A	N/A	N/A	N/A	\$0	\$0	0.890	\$0
2012	b	N/A	N/A	N/A	N/A	\$0	\$0	0.840	\$0
2013	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.792	\$83,746
2014	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.747	\$78,988
2015	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.705	\$74,547
2016	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.665	\$70,317
2017	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.627	\$66,299
2018	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.592	\$62,598
2019	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.558	\$59,003
2020	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.527	\$55,725
2021	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.497	\$52,553
2022	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.469	\$49,592
2023	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.442	\$46,737
2024	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.417	\$44,094
2025	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.394	\$41,662
2026	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.371	\$39,230
2027	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.350	\$37,009
2028	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.331	\$35,000
2029	b	N/A	N/A	N/A	N/A	\$105,740	\$105,740	0.312	\$32,991
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									\$930,089
Comments: The expected useful life of the project is 19 years. TDS: total dissolved solids									

(1) Complete these columns if dollar value is being claimed for the benefit.

PROJECT 4:

City of Goleta, San Jose Creek Capacity Improvement and Fish Passage Project

Project 4: City of Goleta, San Jose Creek Capacity Improvement and Fish Passage Project

The San Jose Creek Capacity Improvement and Fish Passage Project (Project 4 or Project) will consist of the removal and reconstruction of the San Jose Creek Flood Control Channel. When completed, this multiobjective Project will increase flood conveyance capacity, reduce flood hazard, and provide fish passage for migrating endangered steelhead trout. This Project, a cooperative effort between the City of Goleta and Santa Barbara County Flood Control District, will remove residential, commercial, and industrial properties from the regulatory flood plain. The new channel will include an articulated concrete revetment bottom that will (1) allow for fish passage during medium and low-flow events, (2) reduce water quality impacts to the Goleta Slough, and (3) increase groundwater recharge.

The existing flood control channel acts as a barrier to the migration of Southern California steelhead trout (*O. Mikiss*). During winter/spring flow events, fish are unable to swim up the channel; in order to allow for fish passage, the channel must be modified. The proposed Project will include a low-flow channel designed specifically for fish passage. Completion of this Project will remove a significant barrier to fish passage and help restore steelhead runs in San Jose Creek. The benefits associated with Project 4 are summarized in Exhibit 8.4-1. A comparison of the costs and benefits is provided in Exhibit 8.4-2.

EXHIBIT 8.4-1

Project 4 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits (Attachment 7)		
Increased groundwater supply	Quantitative	Local
Water Quality and Other Expected Benefits		
Water quality	Qualitative	Local
Aesthetic	Qualitative	Local
Environmental	Qualitative	State
Flood Damage Reduction (Attachment 9)		
Avoided flood damages	Monetized	Local

EXHIBIT 8.4-2

Project 4 Benefit and Cost Summary

Type of Benefits/Costs	Present Value
Capital and O&M Costs	\$22,774,512
Quantitative Benefits	
Avoided flood damages and other costs	\$54,252,000
Qualitative Benefits	Qualitative Indicator
Increased groundwater supply	+
Water quality	+
Aesthetic	++
Environmental	++
+ indicates net benefits are likely to increase	
++ indicates net benefits are likely to increase significantly	

Water Quality Benefits

Improved Water Quality

Without the Project, San Jose Creek would continue to flow through the existing flood control channel. Current water quality issues exist with bacteria and nitrate levels within the creek. The concrete channel has exacerbated these problems, given it does not allow natural filtration or biological activity to remove some of these substances from the stream flow before it reaches Goleta Slough and Goleta Beach.

With the Project, the articulated concrete revetment bottom will allow for natural filtration of runoff, especially during low-flow events. This natural filtration will improve water quality. Also, since flood waters will be better controlled, pollution from flooded agricultural and industrial areas will be reduced, and overall contamination of Goleta Slough and Goleta Beach will be reduced.

Currently, Goleta Slough has access for kayaking and fishing from Goleta Beach. However, Goleta Slough was listed as an impaired water body by the SWRCB due to high levels of pathogens and priority organics (Appendix 8-4, SWRCB Impaired Stream List). As part of an independent Project, the Santa Barbara County Parks Department is planning improvements to these areas to provide enhanced recreational opportunities for kayaking and nature observation. Improving the water quality in Goleta Slough and Goleta Beach will benefit those who use the area for recreation. The impact to recreation has not been quantified; therefore, the benefit is discussed qualitatively.

Other Benefits

Aesthetics

The Project will improve the visual appearance of the channel itself and of the surrounding creek banks. The existing channel and land directly adjacent can only be

described as aesthetically unpleasing. There are weeds and gravel on the strips of land along the top of the channel. The channel itself is a patchwork of crack filling epoxy. The articulated concrete revetment bottom and the varying flows created by the weirs in the fish passage channel will improve channel conditions and likely attract more local wildlife, significantly improving the aesthetic appeal of the creek, and raising community awareness and visibility of this creek and associated creek habitat. The Project will provide this portion of the City, which is a DAC, with a tangible and attractive model project, which will be a community asset and a potential template project for other communities to use.

Furthermore, this Project is within “Old Town Goleta,” which is a redevelopment area as well as the “Gateway” to the City of Goleta and the Goleta Valley. Because this is such a high visibility area and a high visibility project, improving the aesthetics in addition to improving water quality and water resources will be highly beneficial in the setting the tone and underscoring the City’s dedication to its core goals. The impact to visual appearance has not been quantified; therefore, the benefit is discussed qualitatively.

Environmental

The Project will significantly contribute to the enhancement of fish and wildlife habitat and provide the City with an opportunity for environmental education. Restoration of this channel will remove an impediment to the migration of the endangered steelhead trout. With the design of the existing flood control channel, fish are unable to swim up the channel during low- and high-flow events because of its topography or flow velocity; to allow for fish passage, the channel must be modified. The Project will include a low-flow channel designed specifically for fish passage. The upper section of San Jose Creek contains 5.49 miles of historical spawning grounds for the steelhead. In the report, *Steelhead Assessment and Recovery Opportunities in Southern Santa Barbara County* (Appendix 8-4), San Jose Creek is listed as a focal watershed for species recovery. San Jose Creek ranks second out of 44 streams listed in the report as opportunities for steelhead recovery.

The Project is also expected to improve water quality and temperature for migrating steelhead by reducing water temperature in the channel during low-flow events. This will occur through shading the waterway from direct sunlight, which in turn will facilitate aquatic life and vegetation and by the cooler groundwater being able to seep up through the articulated concrete revetment bottom. The area has a high groundwater table and the articulated concrete revetment bottom was selected because it will also relieve any pore pressure that would build up behind the walls of the channel if the bottom were solid concrete. Residents of California place a significant value on the recovery of threatened and endangered species (Appendix 8-4, Passive Use Value of Wild Salmon).

Furthermore, as a Gateway project, the Project will provide the City with a unique opportunity to educate the community education and raise awareness. Its location garners a large amount of attention, thus providing the City with the ability to showcase the environmental merits of the Project and raise community awareness of healthy urban riparian environs and its associated flora and fauna. The Project also will help to bring attention to the overall San Jose Creek watershed area and goals expressed in the San Jose Creek Watershed Plan (Appendix 8-4). The impact to the population of steelhead trout and riparian vegetation has not been quantified; therefore, the benefit is discussed qualitatively.

Economic Justice

The Project is located in the redevelopment area of the City of Goleta. This portion of the City is a DAC, hence the City's investment in this Project is also a significant investment in the heart of "Old Town Goleta." The City's commitment to this Project will provide the community with an exemplary model project, which will serve as a source of pride for "Old Town Goleta" residents. The short-term infusion of economic stimulus associated with the construction efforts will assist small-businesses, and locally owned restaurants will have a concentrated benefit. The long-term benefits associated with greater investment into commercial and residential properties as a result of the reduced flooding potential will have a direct and positive impact on economic justice.

Distribution of Benefits and Identification of Beneficiaries

The increased water quality, aesthetics, environmental, and economic justice benefits would not only benefit local residents, but also other residents of California. Use values from the improved water quality would accrue to those who recreate at Goleta Slough or Goleta Beach. However, all Californians will benefit from the improved steelhead habitat. Increased fish passage would increase steelhead populations to aid in species recovery. This would benefit local, state, and federal interests.

Benefits Timeline

The estimated life of the Project is 75 years. Benefits will begin in full in year 2014, after 3 years of construction beginning in 2011.

Potential Adverse Effects

Temporary impacts as a result of Project implementation will be mitigated. The Project will occur within the existing flood control channel and along the 7-foot-wide right-of-way purchased from the California Department of Transportation (Caltrans). The land purchased from Caltrans has no independent utility; its only value is as part of the right-of-way for Highway 217. Including it as part of the flood control channel will have no impact on Highway 217, and no long-term impacts expected as a result of the Project. There will be no adverse impacts after construction.

Summary of Findings

The most significant qualitative environmental benefit of Project 4 will be improved steelhead habitat. As previously mentioned, San Jose Creek has high-quality steelhead restoration opportunities relative to other watersheds in the region, and residents of California place significant value on management of rare and endangered species. Other benefits discussed qualitatively are improved groundwater quality, aesthetic characteristics of the San Jose Creek, educational opportunities, raising public awareness, and economic justice.

Uncertainties

The degree of benefit to fish and wildlife resources in San Jose Creek is uncertain. If the Project improves the migration of steelhead, which it is expected to do, the environmental benefits of the Project would be significant.

PROJECT 5:

**Central Coast Water Authority,
Water Supply Reliability and Infrastructure Improvement Project**

Project 5: Central Coast Water Authority, Water Supply Reliability and Infrastructure Improvement Project

As part of its delivery system, the Central Coast Water Authority (CCWA) owns and operates a pipeline that moves water from the Santa Ynez Pumping Plant located in the Santa Ynez Valley to Lake Cachuma. The pipeline was originally constructed in the 1960s for the purpose of delivering water from Lake Cachuma to the Santa Ynez Valley. However, CCWA acquired the pipeline in the mid-1990s to complete its water conveyance system for its south Santa Barbara County participants (which was part of the overall effort to install Phase II of the Coastal Branch of the SWP).

At two locations, the pipe has been exposed because of erosion of overlying soils as a result of high flows. Pipe exposed in this manner is placed at risk of failing, because the exposed pipe has lost the structural confinement of backfill; and because during flood events it will bridge and obstruct water flow, which will subject the pipeline to strong external forces arising from high-flow velocities. The Water Supply Reliability and Infrastructure Improvement Project (Project 5 or Project) will prevent failure that would essentially interrupt all water delivery operations for an extended period of time. The benefits associated with Project 5 are summarized in Exhibit 8.5-1. A comparison of the costs and benefits is provided in Exhibit 8.5-2.

EXHIBIT 8.5-1

Project 5 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits (Attachment 7)		
Avoided water supply costs	Monetized	Local
Increased groundwater supply	Qualitative	Local
Water Quality and Other Expected Benefits		
Groundwater quality	Qualitative	Local
Avoided repair costs	Quantitative	Local
Environmental	Qualitative	State

EXHIBIT 8.5-2

Project 5 Benefit and Cost Summary

Type of Benefits/Costs	Present Value
Capital and O&M Costs	\$610,579
Quantitative Benefits	
Avoided water supply costs	\$531,587
Avoided repair costs	\$392,399
Qualitative Benefits	Qualitative Indicator
Groundwater quality	+
Increased groundwater supply	+
Environmental	+
+ indicates net benefits are likely to increase	
++ indicates net benefits are likely to increase significantly	

Water Quality Benefits

Groundwater Quality

Without the Project, CCWA's pipeline delivering water to Lake Cachuma is at risk of catastrophic failure. If a catastrophic failure occurred, SWP deliveries would be interrupted for a considerable period of time, which would impact groundwater quality in the Santa Ynez groundwater basin by reducing SWP water in water releases. By contract agreement, between South Coast Water Agencies and various downstream water purveyors, the U.S. Bureau of Reclamation conducts water rights releases from Lake Cachuma that maximize the percentage of SWP water in these deliveries. This is done to increase the amount of high-quality SWP water into the Santa Ynez watershed to reduce salt loading. In addition, the migration of salts through the watershed and toward the ocean is facilitated by the high-quality SWP water, and this improves groundwater quality. The impact to groundwater quality in the Santa Ynez watershed has not been quantified; therefore, this benefit is discussed qualitatively.

Other Benefits

Avoided Repair Costs

An unplanned break would create higher repair costs. Each spill over 10,000 cfs would expose more pipe. CCWA estimates that for every 1,525 AF of spill volume, an additional foot of pipeline is exposed. Given the average volume of spill since 2003, (60,915 AF), the estimated extra length of exposed pipeline that would need to be repaired is approximately 40 feet. This would translate to increased construction cost of approximately 20 percent, or \$100,000. The increased cost would be for the construction component only. Engineering and permitting would likely stay the same. If there is a 50 percent probability of failure with the next spill over 10,000 cfs, and 100 percent

probability with the next spill over 20,000 cfs, the expected annual avoided damage is \$37,500. Over the life of the Project, the expected avoided damage totals \$392,399.

Environmental

Without the Project, CCWA's pipeline delivering water to Lake Cachuma is exposed through a section that traverses San Lucas Creek and could block Southern California steelhead trout passage during low- to medium-flow conditions. With the Project, the proposed repair will lower and encase the pipeline so that the creek channel will no longer be blocked for fish passage. Residents of California place a significant value on the recovery of threatened and endangered species (Appendix 8-5, Passive Use Value of Wild Salmon). Implementing this Project is a significant step in establishing steelhead populations in San Lucas Creek. The impact to the population of these species has not been quantified; therefore, this benefit is discussed qualitatively.

Distribution of Benefits and Identification of Beneficiaries

The avoided decline in groundwater quality in the Santa Ynez watershed will benefit local groundwater users, both agriculture and municipal. Lowering the exposed pipe from San Lucas Creek would benefit the residents of California.

Benefits Timeline

The estimated life of the Project is 30 years. Benefits will begin in full in year 2014, after 3 years of Project construction beginning in 2011.

Potential Adverse Effects

Temporary impacts from Project implementation would be caused by temporary and localized construction activities and will be mitigated. The Project will cause minor disturbances that will be mitigated, and no long-term impacts are expected as a result of the Project. There will be no impacts after construction.

Summary of Findings

The monetized other benefits of Project 5 are avoided expected repair costs. The South County agencies will avoid approximately \$392,399 in expected costs in total over the life of the Project, which would not occur without Project implementation. Groundwater and environmental benefits are only discussed qualitatively.

Uncertainties

There is uncertainty regarding the probability that the pipeline will fail within any given year. In addition, climate change could impact the frequency and significance of high-flow or flood events. The current estimate of pipeline failure is based on available information and does not incorporate the impacts of an altered hydrology.

Table 16-5, Water Quality and Other Expected Benefits									
(Benefits in 2009 dollars)									
Project 5: Central Coast Water Authority, Water Supply Reliability and Infrastructure Improvement Project									
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit	Measure of Benefit	Without Project	With Project	Change Resulting from Project (e) – (d)	Unit \$ Value	Annual \$ Value	Discount Factor	Discounted Benefits
		(Units)				(1)	(f) x (g) (1)	(1)	(h) x (i) (1)
2009	Avoided Repair	Feet	240	240	0	\$0	\$0	1.000	\$0
2010	Avoided Repair	Feet	240	240	0	\$0	\$0	0.943	\$0
2011	Avoided Repair	Feet	240	240	0	\$0	\$0	0.890	\$0
2012	Avoided Repair	Feet	240	240	0	\$0	\$0	0.840	\$0
2013	Avoided Repair	Feet	240	240	0	\$0	\$0	0.792	\$0
2014	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.747	\$28,022
2015	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.705	\$26,436
2016	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.665	\$24,940
2017	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.627	\$23,528
2018	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.592	\$22,196
2019	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.558	\$20,940
2020	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.527	\$19,755
2021	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.497	\$18,636
2022	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.469	\$17,581
2023	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.442	\$16,586
2024	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.417	\$15,647
2025	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.394	\$14,762
2026	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.371	\$13,926
2027	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.350	\$13,138
2028	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.331	\$12,394
2029	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.312	\$11,693
2030	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.294	\$11,031
2031	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.278	\$10,406
2032	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.262	\$9,817
2033	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.247	\$9,262
2034	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.233	\$8,737
2035	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.220	\$8,243
2036	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.207	\$7,776
2037	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.196	\$7,336
2038	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.185	\$6,921
2039	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.174	\$6,529
2040	Avoided Repair	Feet	240	200	40	\$938	\$37,500	0.164	\$6,160
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table)									\$392,399
Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									
Comments: The expected useful life of the project is 30 years.									

(1) Complete these columns if dollar value is being claimed for the benefit.

PROJECT 6:

Goleta Sanitary District, Wastewater Treatment Plant Upgrade

Project 6: Goleta Sanitary District, Wastewater Treatment Plant Upgrade

The Goleta Sanitary District (GSD) Wastewater Treatment Plant Upgrade (Project 6 or Project) will allow the existing wastewater treatment facilities to treat 100 percent of wastewater from the Goleta Valley to full secondary treatment level. The current facilities, with a design capacity of 9 million gallons per day (mgd), can treat 100 percent of the flow to the primary level, but only 4.38 mgd can be treated to secondary standards. The Project will increase the capacity of the secondary treatment structures without increasing the overall capacity of the treatment plant.

New construction will include a new biofilter, an aeration basin, two new secondary sedimentation tanks, and a new solids handling building. Modification of existing structures and equipment will include the conversion of an existing stabilization basin into a flow equalization basin, updating emergency generators, replacing a diesel operated sludge dredge with an electric sludge dredge, and replacing an existing waste gas flare with a new cleaner burning model.

The existing treatment plant discharges the primary and secondary wastewater blend into the Pacific Ocean under a Clean Water Act 301(h) waiver from full secondary standards. GSD applied for a renewal of the 301(h) waiver discharge permit in 2001, and through the permit renewal process, GSD agreed with the Regional Water Quality Control Board (RWQCB) to upgrade the facilities under terms and conditions set forth in a settlement agreement to meet full secondary treatment levels by November 2014.

In conjunction with the upgrade of the liquid treatment process, the Project also will include replacement of outdated and aged equipment with new equipment that meets new air quality regulatory requirements by using cleaner energy technologies. The benefits associated with Project 6 are summarized in Exhibit 8.6-1. A comparison of the costs and benefits are provided in Exhibit 8.6-2.

EXHIBIT 8.6-1

Project 6 Benefit Overview

Type of Benefit	Assessment	Beneficiaries
Water Supply Benefits (Attachment 7)		
Water supply sales	Quantitative	Local/State
Water Quality and Other Expected Benefits		
Wastewater quality	Qualitative	State
Avoided operations costs	Monetized	Local
Avoided water quality fines	Monetized	Local
Air quality	Qualitative	Local
Carbon emissions	Qualitative	State

EXHIBIT 8.6-2

Project 6 Benefit and Cost Summary

Type of Benefits/Costs	Present Value
Capital and O&M Costs	\$31,008,739
Quantitative Benefits	
Avoided operations costs	\$3,876,767
Avoided water quality fines	\$881,640
Qualitative Benefits	Qualitative Indicator
Water supply reliability	++
Wastewater quality	++
Air quality	+
Carbon emissions	+
+ indicates net benefits are likely to increase	
++ indicates net benefits are likely to increase significantly	

Water Quality Benefits

Wastewater Quality

The existing wastewater treatment plant discharges a blend of primary and secondary treated wastewater to the Pacific Ocean, 1 mile offshore of Goleta Beach County Park. Upgrading the existing wastewater treatment facilities will result in the ability to treat 100 percent of the wastewater from the Goleta Valley to the full secondary treatment level, thereby improving the water quality of both the effluent being discharged and the receiving ocean waters. The Project will decrease the amount of solids and oxygen demanding compounds entering the Pacific Ocean and the disinfection chemicals that will need to be added to the treated effluent, decreasing the formation of chlorination byproducts.

The current National Pollutant Discharge Elimination System permit allows GSD to discharge a final effluent with up to 63 mg/L of total suspended solids (TSS); the new permit will limit this TSS discharge to 30 mg/L. At the current permitted capacity of 7.64 mgd, a maximum of 4,010 pounds per day (1,465,000 pounds per year) of TSS could be discharged. At the completion of this Project, the upgraded treatment plant operating at a full capacity of 9 mgd will be limited to a TSS discharge of 2,250 pounds per day (822,000 pounds per year), a net decrease in potential TSS discharge of 1,760 pounds per day (643,000 pounds per year).

Permitted concentrations of biochemical oxygen demand (BOD) will decrease from the current 98 mg/L to the full secondary concentration of 30 mg/L. A similar calculation to determine the total effect of BOD on the ocean shows an overall decrease of 3,990 pounds per day (1,457,000 pounds per year) of BOD discharged to the Pacific Ocean.

The cleaner discharge will enhance shoreline and beach recreation, commercial and sport fishing, fish migration, and marine habitat. In particular, improving the wastewater discharge will also improve ocean water quality in the vicinity of Campus Beach and Goleta Beach County Park, which are used for swimming, surfing, and recreational fishing. The impact to the receiving ocean water quality has not been quantified; therefore, this benefit is discussed qualitatively.

Other Benefits

Avoided Operations Costs

Without the Project, the wastewater treatment plant would continue to operate older and inefficient equipment such as pumps, air blowers, generators, and a diesel-operated dredge. With the Project, this equipment will be replaced with more efficient and lower emission equipment, thereby reducing the carbon emissions associated with the facility and in turn, reducing its carbon footprint. Replacement of conventional blowers with more efficient blowers will result in an operating cost savings up to 40 percent. Updated blowers and other equipment replacement will save \$20,000 per month in power costs. The replacement of the diesel dredge will avoid \$1,600 per year in fuel costs (\$3,500 for fuel minus \$1,900 for electricity for new dredge). The upgrade will also result in a reduced demand for chemicals, avoiding \$75,000 per year in operations costs. The present value of the avoided damages from improved water quality over the life of the Project is \$3,876,767 (Table 16A-6).

Avoided Water Quality Fines

Without the Project, GSD would likely violate water quality standards twice a month. The minimum fine is \$3,000 for each violation. This would cost \$72,000 annually. With the Project, GSD will avoid \$881,640 in water quality fines over the life of the Project (Table 16B-6).

Air Quality

With the Project, the wastewater treatment plant will improve the current level of emissions and reduce total carbon dioxide emissions. The updated plant equipment will reduce emissions of reactive organic compounds, particulate matter, nitrogen oxide, and sulfur oxide (Exhibit 8.6-3). The change in local air quality has not been quantified; therefore, this benefit is discussed qualitatively.

EXHIBIT 8.6-3

Project 6 Air Quality Impacts

Emission Type	Change (tons/year)
Reactive organic compounds	-0.04
Nitrogen dioxide	-1.71
Carbon monoxide	+0.13
Sulfur oxide	-0.02
Particulate matter less than 2.5 micrometers	-0.14
Particulate matter less than 10 micrometers	-0.14

Distribution of Benefits and Identification of Beneficiaries

The GSD service area (which includes the “Old Town Goleta” DAC) will benefit from the avoided operations cost from the wastewater treatment plant upgrade. The improved air quality will benefit the residents in Goleta Valley. The improved water quality and the reduction in carbon dioxide emissions will benefit the residents of California. Reduced carbon emissions is a goal of the State of California as reflected in *Assembly Bill 32, Global Warming Solutions Act of 2006* (Appendix 8-6).

Benefits Timeline

The estimated life of the Project is 48 years. Benefits will begin in 2014, after 3 years of Project construction beginning in 2011.

Potential Adverse Effects

Temporary impacts as a result of Project implementation would be due to replacement and expansion of existing facilities and will be mitigated. No adverse long-term impacts are expected as a result of updating the existing wastewater treatment plant.

Summary of Findings

The majority of monetized other benefits of Project 6 are the avoided operation costs of the wastewater treatment plant. GSD will avoid approximately \$3,876,767 in operations costs over the life of the Project. However, there are also significant potential benefits of the improved water quality. Goleta State Beach is a popular recreation area for Californians, and residents of the state collectively hold a high value for improving steelhead habitat (Appendix 8-6, Passive Use Value of Wild Salmon). The improvement to water quality outflow to the Pacific Ocean would positively affect both of these benefits.

Uncertainties

The impact to the ocean water quality in the region is uncertain. Changes in population along the coastal region of Central California and changes in ocean conditions due to changing climate could increase the benefits of this Project.

Table 16A-6, Water Quality and Other Expected Benefits									
(Benefits in 2009 dollars)									
Project 6: Goleta Sanitary District, Wastewater Treatment Plant Upgrade									
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit a) avoided operational costs	Measure of Benefit (Units)	Without Project	With Project	Change Resulting from Project (e) – (d)	Unit \$ Value (1)	Annual \$ Value (f) x (g) (1)	Discount Factor (1)	Discounted Benefits (h) x (i) (1)
2009	a	Costs	N/A	N/A	N/A	\$0	\$0	1.000	\$0
2010	a	Costs	N/A	N/A	N/A	\$0	\$0	0.943	\$0
2011	a	Costs	N/A	N/A	N/A	\$0	\$0	0.890	\$0
2012	a	Costs	N/A	N/A	N/A	\$0	\$0	0.840	\$0
2013	a	Costs	N/A	N/A	N/A	\$0	\$0	0.792	\$0
2014	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.747	\$236,500
2015	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.705	\$223,203
2016	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.665	\$210,539
2017	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.627	\$198,508
2018	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.592	\$187,427
2019	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.558	\$176,663
2020	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.527	\$166,848
2021	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.497	\$157,350
2022	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.469	\$148,485
2023	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.442	\$139,937
2024	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.417	\$132,022
2025	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.394	\$124,740
2026	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.371	\$117,459
2027	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.350	\$110,810
2028	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.331	\$104,795
2029	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.312	\$98,779
2030	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.294	\$93,080
2031	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.278	\$88,015
2032	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.262	\$82,949
2033	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.247	\$78,200
2034	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.233	\$73,768
2035	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.220	\$69,652
2036	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.207	\$65,536
2037	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.196	\$62,054
2038	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.185	\$58,571
2039	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.174	\$55,088
2040	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.164	\$51,922
2041	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.155	\$49,073
2042	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.146	\$46,224
2043	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.138	\$43,691
2044	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.130	\$41,158
2045	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.123	\$38,942
2046	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.116	\$36,726
2047	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.109	\$34,509
2048	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.103	\$32,610
2049	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.097	\$30,710
2050	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.092	\$29,127
2051	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.087	\$27,544
2052	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.082	\$25,961
2053	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.077	\$24,378
2054	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.073	\$23,112
2055	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.069	\$21,845
2056	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.065	\$20,579
2057	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.061	\$19,313
2058	a	Costs	N/A	N/A	N/A	\$316,600	\$316,600	0.058	\$18,363
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									\$3,876,767
Comments: The expected useful life of the project is over the entire period of analysis, 48 years.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16B-6, Water Quality and Other Expected Benefits									
(Benefits in 2009 dollars)									
Project 6: Goleta Sanitary District, Wastewater Treatment Plant Upgrade									
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit b)	Measure of Benefit	Without Project	With Project	Change Resulting from Project (e) – (d)	Unit \$ Value	Annual \$ Value	Discount Factor	Discounted Benefits
		(Units)				(1)	(f) x (g) (1)	(1)	(h) x (i) (1)
2009	b	Fines	24	24	0	\$3,000	\$0	1.000	\$0
2010	b	Fines	24	24	0	\$3,000	\$0	0.943	\$0
2011	b	Fines	24	24	0	\$3,000	\$0	0.890	\$0
2012	b	Fines	24	24	0	\$3,000	\$0	0.840	\$0
2013	b	Fines	24	24	0	\$3,000	\$0	0.792	\$0
2014	b	Fines	24	0	24	\$3,000	\$72,000	0.747	\$53,784
2015	b	Fines	24	0	24	\$3,000	\$72,000	0.705	\$50,760
2016	b	Fines	24	0	24	\$3,000	\$72,000	0.665	\$47,880
2017	b	Fines	24	0	24	\$3,000	\$72,000	0.627	\$45,144
2018	b	Fines	24	0	24	\$3,000	\$72,000	0.592	\$42,624
2019	b	Fines	24	0	24	\$3,000	\$72,000	0.558	\$40,176
2020	b	Fines	24	0	24	\$3,000	\$72,000	0.527	\$37,944
2021	b	Fines	24	0	24	\$3,000	\$72,000	0.497	\$35,784
2022	b	Fines	24	0	24	\$3,000	\$72,000	0.469	\$33,768
2023	b	Fines	24	0	24	\$3,000	\$72,000	0.442	\$31,824
2024	b	Fines	24	0	24	\$3,000	\$72,000	0.417	\$30,024
2025	b	Fines	24	0	24	\$3,000	\$72,000	0.394	\$28,368
2026	b	Fines	24	0	24	\$3,000	\$72,000	0.371	\$26,712
2027	b	Fines	24	0	24	\$3,000	\$72,000	0.350	\$25,200
2028	b	Fines	24	0	24	\$3,000	\$72,000	0.331	\$23,832
2029	b	Fines	24	0	24	\$3,000	\$72,000	0.312	\$22,464
2030	b	Fines	24	0	24	\$3,000	\$72,000	0.294	\$21,168
2031	b	Fines	24	0	24	\$3,000	\$72,000	0.278	\$20,016
2032	b	Fines	24	0	24	\$3,000	\$72,000	0.262	\$18,864
2033	b	Fines	24	0	24	\$3,000	\$72,000	0.247	\$17,784
2034	b	Fines	24	0	24	\$3,000	\$72,000	0.233	\$16,776
2035	b	Fines	24	0	24	\$3,000	\$72,000	0.220	\$15,840
2036	b	Fines	24	0	24	\$3,000	\$72,000	0.207	\$14,904
2037	b	Fines	24	0	24	\$3,000	\$72,000	0.196	\$14,112
2038	b	Fines	24	0	24	\$3,000	\$72,000	0.185	\$13,320
2039	b	Fines	24	0	24	\$3,000	\$72,000	0.174	\$12,528
2040	b	Fines	24	0	24	\$3,000	\$72,000	0.164	\$11,808
2041	b	Fines	24	0	24	\$3,000	\$72,000	0.155	\$11,160
2042	b	Fines	24	0	24	\$3,000	\$72,000	0.146	\$10,512
2043	b	Fines	24	0	24	\$3,000	\$72,000	0.138	\$9,936
2044	b	Fines	24	0	24	\$3,000	\$72,000	0.130	\$9,360
2045	b	Fines	24	0	24	\$3,000	\$72,000	0.123	\$8,856
2046	b	Fines	24	0	24	\$3,000	\$72,000	0.116	\$8,352
2047	b	Fines	24	0	24	\$3,000	\$72,000	0.109	\$7,848
2048	b	Fines	24	0	24	\$3,000	\$72,000	0.103	\$7,416
2049	b	Fines	24	0	24	\$3,000	\$72,000	0.097	\$6,984
2050	b	Fines	24	0	24	\$3,000	\$72,000	0.092	\$6,624
2051	b	Fines	24	0	24	\$3,000	\$72,000	0.087	\$6,264
2052	b	Fines	24	0	24	\$3,000	\$72,000	0.082	\$5,904
2053	b	Fines	24	0	24	\$3,000	\$72,000	0.077	\$5,544
2054	b	Fines	24	0	24	\$3,000	\$72,000	0.073	\$5,256
2055	b	Fines	24	0	24	\$3,000	\$72,000	0.069	\$4,968
2056	b	Fines	24	0	24	\$3,000	\$72,000	0.065	\$4,680
2057	b	Fines	24	0	24	\$3,000	\$72,000	0.061	\$4,392
2058	b	Fines	24	0	24	\$3,000	\$72,000	0.058	\$4,176
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table)									\$881,640
Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									
Comments: The expected useful life of the project is over the entire period of analysis, 48 years.									

(1) Complete these columns if dollar value is being claimed for the benefit.

PROJECT 7:

City of Guadalupe, Recycled Water Feasibility Study

Project 7: City of Guadalupe, Recycled Water Feasibility Study

The City of Guadalupe (City), a DAC, is completing an upgrade to its wastewater treatment plant. Concurrent with the implementation of the current upgrade, it would be realistic and a relatively straightforward process to upgrade the plant to tertiary treatment. A comprehensive recycled water feasibility study (Study) is required to adequately assist the City in identifying the best use of the City's treated water resources and best design of the recycled water distribution system. The proposed Study (Project 7 or Project) will evaluate and describe the costs and benefits of recycled water opportunities and may lead to a construction project that would address the City's water supply needs. Without Prop 84 funds, the City does not have any sources of funding to undertake the Study.

Water Quality Benefits

Groundwater Quality

The proposed Study does not directly benefit groundwater quality. Instead, the Study will provide the City with an informed plan and background document, which would support a tertiary treatment system upgrade. If implemented, the treatment and discharge changes would provide high-quality water for landscape irrigation, which would result in high-quality water for groundwater recharge. This groundwater improvement could potentially reduce future treatment costs and benefit ecosystems of the Santa Maria River. Although probable, the benefits of constructing a project based on the Study are speculative; therefore, the benefits are discussed qualitatively.

Other Benefits

Environmental

The proposed Study would not have a direct environmental benefit; however, should a tertiary treatment plant upgrade follow, the potential for effluent discharged from the upgraded wastewater treatment plant could indirectly benefit existing wetlands through groundwater recharge. Species that are typically associated with wetland habitat similar to the one affected by the Project include the La Graciosa thistle, tidewater goby, California red-legged frog (threatened), Southern Pacific pond turtle, two-striped garter snake, long-billed curlew, and white-faced ibis. Although probable, the benefits of constructing a project based on the Study are speculative; therefore, the benefits are discussed qualitatively.

Distribution of Benefits and Identification of Beneficiaries

The beneficiaries of the Study and possible construction of the wastewater treatment plant improvements would be the residents of the City of Guadalupe. The groundwater changes would benefit residents of a DAC, while the state would benefit from the positive environmental effects of the Project.

Benefits Timeline

If the Study finds the upgrade to be feasible and the upgrade is implemented, benefits would begin as early as 2014 and accrue for 30 years.

Potential Adverse Effects and Uncertainties

There are no potential adverse effects or uncertainties related to the Study.